



Analysis of Clove Supply in Jombang District Regency, East Java Province, Indonesia (Case Study CV Mega Tiga Anugrah)

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ABSTRACT: Cloves are an agricultural commodity that has great potential. CV Mega Tiga Anugrah is a clove supplier located on Java Island, where the clove supply is obtained from farmers from various regions on Sulawesi Island. This research aims to analyze product flows, money flows and information flows as well as the supply chain actors' activities. This research uses a descriptive qualitative method with a case study approach. The research results show that the clove supply chain mechanism starts from the flow of products from farmers, small collectors, medium collectors, large collectors, and CV companies. Mega Tiga Anugrah, until they reached the cigarette factory. The flow of information in the clove supply chain is well integrated between supply chain actors, while the flow of money occurs by the agreement of the supply chain actors. Supply chain activities consist of two actors in the supply chain, namely the main and supporting actors. The main actors are farmers, small, medium, and large collectors, and the CV Mega Tiga Anugrah company. Meanwhile, the supporting actors include transport workers, factory workers, and the Cigarette Factory Company PT Hanjaya Mandala Sampoerna Tbk.

KEYWORDS: Clove commodities, information flow, money flow, product flow, supply chain.

INTRODUCTION

Indonesia is the country with the largest clove production in the world in 2019 (FAO). Cloves are a native Indonesian plant that has been cultivated since the Dutch colonial era, and is one of the plantation crops that has become a leading export commodity (Zenti et al., 2021); (Ainun et al., 2022); (Rauf et al., 2023). Cloves (*Syzygium aromaticum*) are one of the spice plants belonging to the Myrtaceae plant in the order Myrtales (Gaylor et al., 2014). This type of plant is also an herbal plant that has long been used in Middle Eastern and Asian countries as a traditional medicine to cure various diseases and to flavor food (Dehghani et al, 2012).

The main role of clove commodities in Indonesia is as additional raw material for tobacco in making kretek cigarettes. Clove cigarette companies in Indonesia are very promising and provide hope for state revenues through cigarette excise and export activities. (Arnez, 2009); (Kumaat et al., 2015); (Ndiba et al., 2016). Clove production in Indonesia, apart from being exported, is also oriented to meet domestic clove consumption needs (Marhawati et al., 2023). Based on its use, 85% to 95% is used specifically in the kretek cigarette industry (Central Statistics Agency, 2016), and the rest is used for other needs such as cooking spices, medicinal ingredients, food preservatives, and others (Danthu et al, 2014).

The clove business is very profitable because it has a very wide market opportunity. At the national level, cloves have ups and downs caused by unpredictable clove supply, price fluctuations, production uncertainty, extreme weather, long distribution channels, transportation, and price stability (Indriani et al., 2019); (Rosadi et al., 2021). Apart from that, clove plants have distinctive characteristics, namely large harvests, then small harvests the following year, and harvests in certain periods (Siregar, 2011). So a mechanism is needed that regulates product availability to consumers. For this reason, integrated supply chain management is needed to meet the needs for raw material supply, a smooth production process, and delivery on schedule to consumers. The role of the supply chain is basically to create added value for products, by moving them from one place to another or making changes to the production of a product to form added value (Arifin et al., 2019).

Supply Chain Management can be explained as an integrative method meaning understanding and managing jointly all aspects of the flow of products, information, and money in the supply chain (Epiphaniou et al., 2020), (Esmaeilian et al., 2020), (Fatorachian & Kazemi, 2021), (Hahn J Gerd, 2020), (Haudi et al., 2022). Supply Chain in particular, (Hu et al., 2019) defines the supply chain as not only limited to factories and suppliers, but also needs to look at the conditions of distributors, warehouses, and retailers and even needs to look at consumer needs. Supply Chain Management can be explained as an integrative method meaning understanding and managing jointly all aspects of the flow of products, information, and money in the supply chain (Epiphaniou et al., 2020),



(Esmaelian et al. , 2020), (Fatorachian & Kazemi, 2021), (Hahn J Gerd, 2020), (Haudi et al., 2022). Supply Chain in particular, (Hu et al., 2019) defines the supply chain as not only limited to factories and suppliers, but also needs to look at the conditions of distributors, warehouses, and retailers and even needs to look at consumer needs. In a supply chain, there are several stages consisting of customers, retailers, distributors, manufacturers, and suppliers. Each stage of the supply chain is connected to the flow of products, information, and money (Sutono, 2019). Implementing a sustainable supply chain has become a key issue for increasing competitive advantage in the market and sustainable business (Husnaeni & Retnoningsih, 2021)

One of the clove suppliers located in Jombang, East Java is CV Mega Tiga Anugrah. This company supplies cloves from collectors in Sulawesi. In this way, collectors act as intermediaries who collect the cloves before sending them to the CV Mega Tiga Anugrah company. The cloves were then sent to the cigarette manufacturing factory PT Hanjaya Mandala Sampoerna Tbk. PT HM Sampoerna Tbk is one of the market leaders and the largest in the cigarette industry in Indonesia with its head office in Surabaya, East Java. The transportation and logistics process for cloves from South Sulawesi Province to East Java Province will involve a series of activities that will be carried out by collectors. This will be the most important part of the clove supply chain and is the aim of the research.

LITERATURE REVIEW POTENTIAL OF CLOVES

The clove plant (*Syzygium aromaticum*) is a shrub shaped like a large tree, with a hard trunk with many branches and twigs. Clove plants can be classified into plantation or industrial plants and belong to the Myrtaceae family. The clove plant in Indonesia began to be known as a plant originating from the Maluku Islands. In the Maluku islands, the oldest clove plants in the world are found; this area is the largest clove producer in the world. The spread of clove plants outside Maluku Island occurred in 1769 and began to enter Java, Kalimantan, and Sumatra around 1970 (Distan.bulelengkab.go.id, 2018).

Approximately 97% of clove plants in Indonesia are cultivated by the people in the form of community plantations spread throughout the province. The remaining 3% is cultivated by private plantations and state plantations (Directorate General of Plantations, 2020). The main product of the clove plant is the flowers which are harvested when the flower petals have not yet opened. Dried clove flowers are one of the main raw materials for kretek cigarettes, which are typical Indonesian cigarettes, and only a few in the food industry. However, with discoveries, other plant parts of cloves, namely the leaves and flower stalks, have also been used as a source of clove oil which is used in the pharmaceutical, cosmetic, and other industries (Nurmansyah BS, et al., 2017).

The potential of the clove plant that has not been utilized optimally is the clove leaves (fallen leaves) and flower stalks. Processed products that can be produced from flowers, leaves, and flower stalks (stems) are (1) clove oil, (2) eugenol from clove oil, and (3) compounds derived from eugenol.

SUPPLY CHAIN

A supply Chain is a chain consisting of all parties involved, both directly and indirectly, to meet consumer demand. The goal of any supply chain is to maximize the overall value produced (Chopra and Meindl, 2007). According to Pujawan (2005), the supply chain is a network of companies that work together to create and distribute products to consumers. These companies usually consist of producers, suppliers, distributors, shops, or retailers as well as supporting companies such as logistics services.

The supply chain is a relationship between the flow of materials or services, the flow of money (return/recycle), and the flow of information from suppliers, producers, distributors, warehouses, and retailers to end customers (upstream ↔ downstream). Indrajit and Djoko Pranoto (2002: 24), say that the supply chain is an organizational network that involves relationships from upstream to downstream, in different processes and activities that produce value that is realized in goods and services in the hands of the final customer. (ultimate customer). The supply chain includes all interactions between suppliers, manufacturers, distributors, and customers. This interaction is also related to transportation, information, scheduling, credit, and cash transfers as well as raw material transfers between the parties involved (Heizer and Render, 2004).

The supply chain includes three parts (Anatan, 2008):

1. Upstream Supply Chain: this section includes the organization's first-tier suppliers and suppliers with whom a relationship has been established.



2. Internal Supply Chain: this section covers all the processes used by the organization in converting input sent by suppliers into output, starting from the time the material enters the company until the product is distributed outside the company.
 3. Downstream Supply Chain: This section includes all processes involved in delivering products to end customers.
- In the supply chain, several main players have the same interests, as follows:

a. Chain 1: Suppliers

The network starts from here, which is the source that provides the first material, where the new distribution chain will start. This first material can be in the form of raw materials, raw materials, auxiliary materials, merchandise, spare parts, and so on.

b. Chain 1-2-3: Supplier-Manufactures-Distribution

Goods that have been produced by manufacturers have started to be distributed to customers. Although there are many ways to distribute goods to customers, the most common is through distributors and this is usually used by most supply chains.

c. Chain 1-2-3-4: Supplier-Manufactures-Distribution-Retail Outlet

Wholesalers usually have their warehouse facilities or can also rent them from other parties. This warehouse is used to store goods before being distributed again to retailers. Here there is an opportunity to obtain savings in the form of inventory and warehouse costs by redesigning the delivery pattern of goods both from manufacturing warehouses and to retail stores.

d. Chain 1-2-3-4-5: Supplier-Manufactures-Distribution-Retail Outlet-Customers

Retailers or retailers offer goods directly to customers or buyers or users of goods. Retail outlets include grocery stores, supermarkets, food stalls, etc

RESEARCH METHODS

This research was conducted at the CV Mega Tiga Anugrah company which is located in Kertorejo Village, Ngoro District, Jombang Regency, East Java Province. This location was chosen deliberately with the consideration that the CV Mega Tiga Anugrah company supplies cloves from collecting traders from the island of Sulawesi and distributed to the PT Hanjaya Mandala Sampoerna Tbk Company, the largest cigarette factory in Surabaya, East Java.

CV Mega Tiga Anugrah Company as "key information" as the first informant is believed to be able to "open the door" for researchers to enter the research object. The research informants were then determined using snowball sampling. This research uses a descriptive qualitative method with a case study approach. The data used in this research are primary and secondary. Primary data was obtained directly from sources involved in the supply chain, while secondary data was obtained from literature and agencies related to the research. The data analysis technique that will be used in this research is the triangulation method, by collecting data, carrying out data reduction, and managing data presentation by conducting credibility tests regarding the data that is already available (Yin & Yin, 2016).

Data collection was carried out by conducting observations, interviews, and field documentation (Nasihin et al., 2020). When carrying out data reduction, you must be able to select information obtained from interviews and observations (J. Richardson, 2018). To manage the presentation of data in this research, a description of the results of the data obtained from data reduction was carried out to prevent bias in interpreting the data held (Yin & Yin, 2016).

RESULTS AND DISCUSSION

Supply Chain Mechanism

The supply chain mechanism involves three main flows, namely product flow, information flow, and money flow. The first is the flow of products that flows from upstream to downstream, the second is the flow of money from downstream to upstream, and the third is the flow of information that can flow from downstream to upstream or vice versa. In general, the structure of the Clove supply chain at CV Mega Tiga Anugrah in Jombang Regency East Java involves several actors. For more details, see Figure 1.

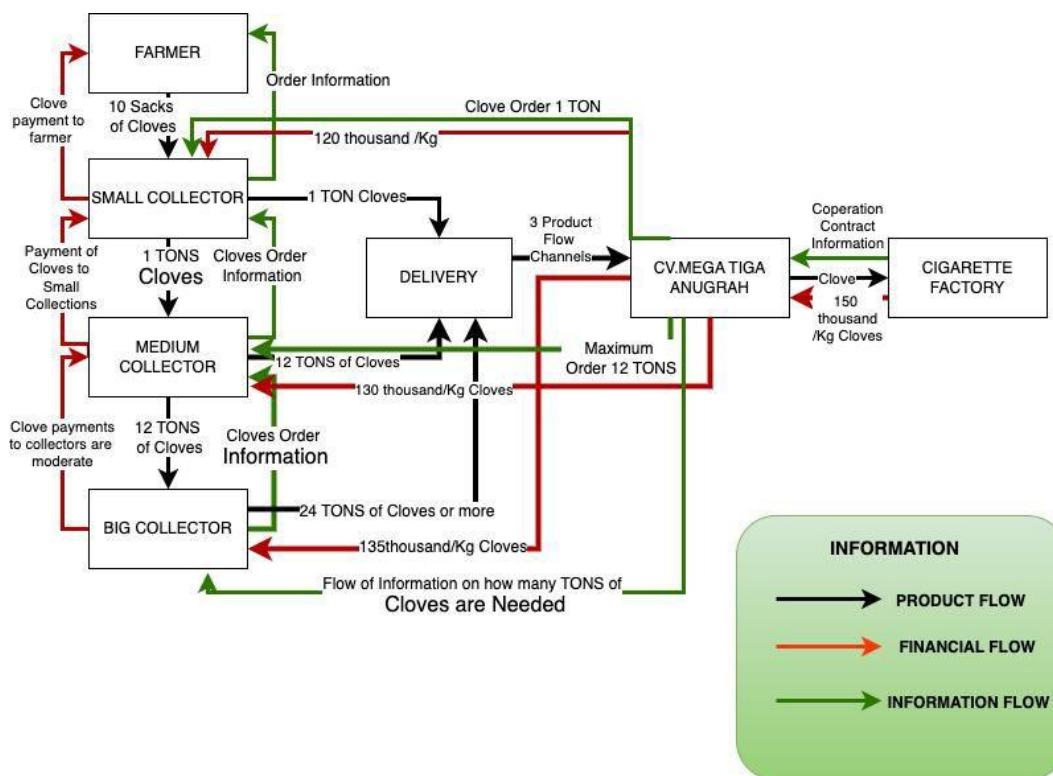


Figure 1. Product flow, money, and clove commodity information

1. PRODUCT FLOW

Farmers in this case are farmers in various regions who produce cloves and sell them to collectors in their respective regions. The supply of cloves from farmers comes from South Sulawesi, West Sulawesi, Central Sulawesi, North Sulawesi, and Gorontalo Province, then through collecting traders until they reach CV Mega Tiga Anugrah. Farmers sell their harvest ranging from 2 to 10 sacks to small collectors. This shows that sales of farmers' products are dominated by small collectors, where farmers and small collector traders have established strong cooperative ties. Even though in writing farmers and traders do not have a cooperation contract in the form of capital assistance or production facilities, the partnership is formed because farmers often sell their crops to these traders, so an emotional bond is formed. Apart from that, farmers' production is not large, making farmers sell their crops directly to village collectors and wholesalers. The results of research conducted by Saptana, et al. (2018) state that farmers generally sell their harvests to village collectors/small collectors, this can happen because farmers cultivate cloves on a small business scale and production quantities are relatively limited.

Small collectors act as intermediaries who are close to farmers because they have direct contact with farmers. Small collectors must collect cloves from farmers in their respective operating areas. The cloves that have been collected are then distributed to medium collectors using pick-up trucks, or small collectors can send them to the CV Mega Tiga Anugrah company with a maximum limit of 1 ton or around 1000 kg. This shows that farmers have the freedom to choose to sell their crops to small collectors. These small collectors buy cloves from farmers for IDR 115,000/kg.

Medium collectors will buy cloves from each small collector. Medium collectors must have adequate land to dry and store cloves, with a storage capacity of around 12 tonnes. These medium collectors usually operate at the district level. Collaboration between small and medium collectors is very important to ensure an adequate supply of cloves for large collectors. Collectors are buying cloves from every small collector in various cities or districts and delivering them using pickups. Once collected, these medium collectors usually arrange delivery between provinces at a price of cloves of IDR 130,000/Kg, with a maximum purchase limit of 1 container. If the collector is located on the island of Java, the cloves are sent to the CV Mega Tiga Anugrah company using



containers. However, if the collector is outside Java, delivery will be made by sea. After the ship docks on Java Island, shipping will continue using containers, until it reaches its final destination at CV Mega Tiga Anugrah.

When the cloves arrive at the CV Mega Tiga Anugrah company warehouse, the loading and unloading process will be carried out by company workers. Next, the cloves will undergo an analysis of quality, water content according to company standards, and quantity. If the analysis results do not match the specified criteria, the company has the option to make a return or reduce the price. Meanwhile, large collectors buy cloves for IDR 135,000/Kg from medium collectors, with a minimum purchase requirement of 2 containers. CV Mega Tiga Anugrah has a warehouse with a capacity of 500 tons of cloves to accommodate the results from collectors. Once collected, the cloves are sold to cigarette factories after a work contract is opened. The CV Mega Tiga Anugrah company must comply with every detail of the contract, including water content, percentage of cleanliness, type of sack, quantity in each sack, and delivery time according to the agreement.

Large collectors will buy cloves from each medium collector. Large collectors have the responsibility to have a storage warehouse with a minimum capacity of 50 tons, as well as transportation facilities to send cloves to companies. Apart from that, large collectors will also carry out the clove drying process according to company requests. After this process is complete, the cloves will be sent to the company, namely CV Mega Tiga Anugrah.

When the cloves arrive at the CV Mega Tiga Anugrah company warehouse, the loading and unloading process will be carried out by company workers. Next, the cloves will undergo an analysis of quality, water content according to company standards, and quantity. If the analysis results do not match the specified criteria, the company has the option to make a return or reduce the price. Meanwhile, large collectors buy cloves for IDR 135,000/Kg from medium collectors, with a minimum purchase requirement of 2 containers. CV Mega Tiga Anugrah has a warehouse with a capacity of 500 tons of cloves to accommodate the results from collectors. Once collected, the cloves are sold to cigarette factories after a work contract is opened. The CV Mega Tiga Anugrah company must comply with every detail of the contract, including water content, percentage of cleanliness, type of sack, quantity in each sack, and delivery time according to the agreement.

This shows that the relationship between small, medium, and large collectors forms an efficient path in the clove supply chain. Total sales reached 30 containers with a clove price of IDR 150,000/Kg. This shows that large traders sell all of their clove production, namely 100%, to cigarette factories. Handling of cloves, especially in supply chain management from the process before entering the CV Mega Tiga Anugrah company warehouse, must be under the supervision of the company owner. Currently, supply chain management collaborates with cigarette factories based on trust and contractual agreements. This shows the importance of cooperative relationships between wholesalers and cigarette factories in maintaining a smooth supply chain and meeting the production needs of cigarette factories on time and with the desired quality.

2. MONEY FLOW

Small collectors need to have a wide network to collect 1 ton of cloves because that is a requirement to be able to sell to medium collectors for IDR 120,000 / kg. Medium collectors, in turn, must have effective channels to reach their target of 12 tonnes which will be sold to large collectors and CV Mega Tiga Anugrah for IDR 130,000 /kg. Large collectors, like other collectors, need to maintain the supply of cloves at medium collectors to ensure stock availability and sales to CV Mega Tiga Anugrah for IDR 135,000 /kg.

The selling price of cloves at each stage in the supply chain is influenced by several factors, including transportation costs, risks, and additional processes carried out by each actor in the distribution and production process. The use of different transportation by small collectors, medium collectors, and large traders will affect the selling price of cloves. Wholesalers sell cloves to cigarette factories at a higher price, namely IDR 150,000/kg, because traders bear additional risks and costs in the distribution process. This includes sorting and cleaning the cloves from gravel in the warehouse before sending them to the cigarette factory. Thus, the selling price of cloves at each stage in the supply chain reflects considerations of costs, risks, and additional value added by each actor in the distribution and production process.

3. INFORMATION FLOW

CV Mega Tiga Anugrah's supply chain shows efficient and well-organized information management. Communication using technology, such as telephones, has made it easier to interact between various actors in the supply chain, from small collectors to large traders.



Small collectors provide information regarding cloves' quality, quantity, and availability to medium collectors. This includes information about the latest harvest, the condition of the cloves, and estimates of the quantity that can be sold. Collectors provide data regarding cloves' quality, quantity, and availability to large collectors. Large collectors study information about cloves obtained from various medium collectors and request additional stock if there is a shortage or additional need. CV Mega Tiga Anugrah received information about clove supplies received from large collectors. Sometimes, if additional cloves are needed in the warehouse, CV Mega Tiga Anugrah will communicate with large collectors. This information includes details of the quality, quantity, and condition of the cloves that will be used as raw material for making cigarettes. Large factories provide information to CV Mega Tiga Anugrah regarding needs, including details of the stock used in the production process.

In the flow of information at CV Mega Tiga Anugrah, there is a procedure where the company opens discussions regarding prices to collectors. However, before doing this, CV Mega Tiga Anugrah must be careful and make sure to know the price set by the factory first. Only after knowing the factory price will CV Mega Tiga Anugrah dare to set a price for collectors. Then, collectors will convey information about prices to farmers. This is done because farmers and collectors do not have access to the prices that have been set when the factory opens the contract. Thus, this process ensures that the price offered to collectors and farmers is cheaper than selling to factories.

The vertical flow of information between collectors and traders is crucial in ensuring a smooth buying and selling process. This allows for effective price negotiation, depending on delivery conditions and demand. The use of technology in communication also helps in estimating a fair price. Collaboration between wholesalers, the CV Mega Tiga Anugrah company, and cigarette factories is also important in meeting the demand for cloves. Suppose the request is fulfilled according to the work contract. In that case, the CV Mega Tiga Anugrah company will wait for the delivery time scheduled by the cigarette factory, thereby maintaining consistency and reliability of supply.

When the price of cloves rises, small collectors tend not to want to call traders, and they prefer to wait for traders to come directly to the field or call to negotiate. On the other hand, when prices fall and clove production is abundant, small collectors will actively call traders to sell farmers' crops, hoping to avoid greater losses. This exchange of information plays an important role in helping make the right decisions in adapting their business strategies to current market conditions. Thus, this shows how important effective information flow is in the clove supply chain to reach a profitable agreement for all parties involved.

CLOVE BUSINESS SUPPLY CHAIN ACTIVITIES

There are two actors in the clove supply chain, namely the main actor and the supporting actor. The main actors are farmers, small collectors, medium collectors, large collectors, and CV Mega Tiga Anugrah. The activities of each main actor are explained in Table 1.

Table 1. Activities of the main actors in the clove supply chain

Number	Supply Chain Actors	Activities	Description
1	Farmer	1. Plant cloves 2. Caring for cloves 3. Harvest cloves 4. Picking 5. Drying 6. Packaging	The drying carried out by farmers is still traditional, just drying in the sun and the way to test the dryness level is by taking one clove and breaking it with two fingers. If the cloves are broken, they can be packaged immediately and sold to small collectors.
2.	Small Collector	1. Collect cloves from farmers in the area where they live. 2. Weigh the cloves 3. Providing pick-up vehicles for delivery to medium collectors.	Carrying out re-weighing before sending to the middle collector
3	Medium Collector	1. Provide a shelter for cloves 2. Collecting cloves from small collectors in the district where he lives. 3. Drying and cleaning from dirt	It has been dried according to the demand and grade desired by the wholesaler



		<ol style="list-style-type: none"> 4. Packing 5. Weigh the cloves 6. provide pick up or containers for provincial deliveries. 	
4	Big Collector	<ol style="list-style-type: none"> 1. Provide a shelter for cloves 2. Collect cloves from each collector in the province where you live. 3. Drying and cleaning 4. Packing 5. Do weighing 6. Providing containers and shipping via sea for delivery to the CV Mega Tiga Anugrah company 	Carry out drying according to the request and grade desired by the CV Mega Tiga Anugrah company using test equipment
5	CV. Mega Tiga Anugrah	<ol style="list-style-type: none"> 1. Provide a large warehouse to store cloves 2. Collect cloves from small, medium, and large collectors. 3. Carry out drying and cleaning according to factory requests. 4. Carry out packaging according to factory requests 5. Weigh the cloves 6. Providing containers and spare container vehicles if there are problems in the delivery process to the cigarette factory. 	Using the test-grade equipment desired by the factory, carry out a sieving process to separate the cloves from dirt such as sand, leaves, and gravel. Carry out packaging according to factory requests, namely using jute sacks.

Supporting actors in the clove supply chain consist of transport workers, factory workers, and cigarette manufacturing companies as the final terminal. Furthermore, it can be seen in table 2.

Table 2. Activities of supporting actors in the clove supply chain

Number	Supply Chain Actors	Activities	Description
1	Transport workers	Providing services for transporting cloves from the collector's place to trucks or containers for further delivery to the destination location.	Transport workers are used to lift or carry cloves from the warehouses of collectors, both medium and large collectors, and the CV Mega Tiga Anugrah company.
2.	Factory workers	<ol style="list-style-type: none"> 1. Providing services to clean cloves from dirt before putting them in sacks 2. Providing services in drying 3. Providing services in packing 	Factory workers are workers at CV Mega Tiga Anugrah who clean cloves from dirt, dry them, and pack them. The cloves that have been agreed upon in the agreement are then sent to the PT Hanjaya Mandala Sampoerna Tbk cigarette factory, as the final terminal.
3	PT Hanjaya Mandala Sampoerna Tbk Cigarette Factory.	The final terminal supplies cloves to be processed into cigarettes.	PT Hanjaya Mandala Sampoerna Tbk is a company that supplies cloves from various clove-producing regions in Indonesia, mainly from the company CV Tiga Mega Anugrah



CONCLUSION

Based on the results of research regarding the clove supply chain at CV Mega Tiga Anugrah, the following conclusions can be drawn: The clove supply chain mechanism at CV Mega Tiga Anugrah starts from the flow of products from farmers, small collectors, medium and large collectors. collector, CV Mega Tiga Anugrah to the final destination of the cigarette factory in East Java. The flow of money occurs with the agreement of the supply chain actors. Meanwhile, the flow of information in the clove supply chain is well integrated between supply chain actors. Supply chain activities in the clove business are carried out by the main actors consisting of farmers, small collectors, medium collectors, large traders, and the CV Mega Tiga Anugrah company. Meanwhile, the supporting actors consist of transport workers, factory workers, and the PT Hanjaya Mandala Sampoerna Tbk cigarette factory.

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